

CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1-3 (Cancelled)

4. (Currently Amended) The encoder according to claim 21 wherein the spread spectrum encoder includes a storage device used for storing the one or more spread spectrum codes and a shifter for serially encoding some of the transmit data values with the one or more spread spectrum codes.

5. (Currently Amended) The encoder according to 4 wherein the shifter includes: a multiplexer having inputs for receiving different chips of the spread spectrum codes and

an output;

a code counter coupled to the multiplexer sequentially selecting different chips of the spread spectrum codes for outputting from the multiplexer; and

an exclusive-OR circuit combining the outputs from the multiplexer with the transmit data values.

6. (Currently Amended) The encoder according to claim 5 wherein the slip encoder includes a slip counter that delays the code counter from outputting, the chips for adjacent spread spectrum codes according to associated transmit data values.

7-9 (Cancelled)

10. (Withdrawn) The spread spectrum correlator according to claim 22 wherein a number of time units associated with the time gaps corresponds with different data values.

11. (Withdrawn) The spread spectrum correlator according to claim 22 wherein the spread spectrum decoder includes a storage device used for storing one or more reference spread spectrum codes; and

a sampling circuit taking samples of the spread spectrum encoded data stream and comparing the samples with the reference spread spectrum codes.

12. (Withdrawn) The spread spectrum correlator according to claim 11 including a match counter counting a number of chips for the reference spread spectrum codes that match and mismatch the samples taken by the sampling circuit and identifying data values according to the number of counted matches and mismatches.

13-14 (Cancelled)

15. (Withdrawn) The spread spectrum correlator according to claim 22 including a data inverter identifying inverted data values output from the slip decode and inverting hits for the identified inverted data values.

16. (Currently Amended) A method for encoding data, comprising:
encoding a first set of transmit data values into an encoded transmit data stream using spread spectrum Pseudo Noise (PN) codes; and.

encoding a second set of transmit data values into the encoded transmit data stream by varying an amount of time delay inserted between the transmission of sequentially generated PN codes output in the encoded transmit data stream, the time delay being an amount of time gap inserted only after completing transmission of a first PN code and only before starting

transmission of a second adjacent PN code so that the second set of transmit data values are associated with time gaps when PN codes are not being transmitted;

using different amounts of a total time delay from the completion of transmission of PN codes until starting transmission of adjacent PN codes for different adjacently transmitted PN codes to represent different values for the second set of transmit data values that are not PN coded.

17. (Currently Amended) The method according to claim 16 including delaying encoding between each of the first set of transmit data values into the encoded data stream for inserting a number of time increments between adjacent PN codes corresponding to the second set of transmit data values.

18. (Currently Amended) The method according to claim 16 including transmitting and receiving the encoded transmit data stream using a wireless Universal Serial Bus (USB) device.

19. (Currently Amended) The method according to claim 16 including extracting the first set of transmit data from the encoded data stream by identifying the PN codes in the encoded data stream and extracting the second set of transmit data from the encoded transmit data stream by identifying an amount of time gap between the identified PN codes.

20. (Currently Amended) The method according to claim 19 including:
comparing samples of the encoded transmit data stream with reference PN codes;

identifying bits in the first set of transmit data values when a predetermined number of the samples match or a predetermined number of the samples mismatch the reference PN codes;

identifying an amount of time slip between the identified bits in the first set of transmit data values; and

identifying bits in the second set of transmit data values according to the amount of identified time slip.

21. (Currently Amended) An encoder, comprising:

a spread spectrum encoder configured to encode transmit data values with one or more spread spectrum codes and generate a corresponding spread spectrum encoded transmit data stream; and

a slip encoder configured to encode other multiple different transmit data values into the encoded transmit data stream by varying time spacing between the spread spectrum codes, wherein the other encoded transmit data values correspond to an amount of clock periods inserted by the slip encoder between the generation of adjacent spread spectrum codes so that generation of the entire spread spectrum codes ~~are-is~~ completed and then time gaps of varying duration with no spread spectrum codes are inserted before starting generation of adjacent subsequently transmitted spread spectrum codes, where an entire total amount of the time gap from an end of transmission of the entire spread spectrum codes to a beginning transmission of the next subsequently transmitted adjacent spread spectrum code corresponds to one of the other multiple different transmit data values that is not spread spectrum encoded and different durations of the entire total time gap used between different pairs of the adjacent spread spectrum codes represent different values for the multiple different transmit data values.

22. (Withdrawn) A spread spectrum correlator, comprising:

a spread spectrum decoder configured to decode data from a spread spectrum encoded data stream; and

a slip decoder configured to decode additional data associated with different time gaps between codes in the spread spectrum encoded data stream, wherein:

the additional data values correspond to an amount of time delay detected between adjacent spread spectrum codes in the spread spectrum encoded data stream;

the amount of time delay between transmission of adjacent spread spectrum codes are time gaps when no spread spectrum codes are being transmitted;

the time gaps start after the spread spectrum codes have been completely transmitted and before a next adjacent spread spectrum code begins being transmitted so that an entire time from an ending transmission time for the spread spectrum codes and a beginning transmission time for the next adjacent spread spectrum code is proportional to a data value for the additional data that is not spread spectrum encoded; and

different varying durations are used for the time gaps between different pairs of adjacent spread spectrum codes and the different durations for the time gaps correspond to different data values for the additional data that is not spread spectrum encoded.

23. (New) An encoder, comprising:

a spread spectrum encoder configured to binary encode data values with one or more spread spectrum codes and generate a corresponding spread spectrum encoded data stream; and

a slip encoder configured to binary encode other multiple different data values into the encoded data stream by varying time spacing between the spread spectrum codes, wherein the other binary encoded data values include inverted binary encoded data values above a threshold data value and correspond to an amount of clock periods inserted by the slip encoder between the generation of adjacent spread spectrum codes so that generation of the entire spread spectrum codes is completed and then time

gaps of varying duration with no spread spectrum codes are inserted before starting generation of adjacent subsequently transmitted spread spectrum codes, where an entire total amount of the time gap from an end of transmission of an entire spread spectrum codes to a beginning transmission of a next subsequently transmitted adjacent spread spectrum code corresponds to one of the other multiple different data values that is not spread spectrum encoded and different durations of the entire total time gap used between different pairs of the adjacent spread spectrum codes represent different values for the multiple different data values.

24. (New) The encoder according to claim 23, wherein the data values and the other data values are transmit data values.